

Nanocarbon for energy storage

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The necessity of developing cleaner, safer and efficient energy technologies has become critical now than ever. Nanotechnology for all its known benefits could offer effective solutions for the emerging energy crisis. Tailored nanostructures of carbon such as graphene and carbon nanotubes are well known for their ability to tune electrical properties and allow development of lighter and efficient high energy storage devices^{1,2}. The interest of energy storage industry in these structures has been on going for a long time. However, as it remains a fact, the limitations in producing these incredible structures on a larger scale have been a hurdle to fully investigate the commercial benefit of these structures. Until recently, when there have been several technological breakthroughs that enabled production of some of these carbon nanostructures at a larger scale³. Though the major barrier in joining academic and industrial interests has been overcome as a result of these recent breakthroughs, there still remain some gaps before establishing a complete commercial applicability of these structures.

We have investigated several nanocarbon systems and tailored them for high surface area along-with micro and meso porosity. These tailored systems in combination with the right electrolyte have shown an improvement in the performance of supercapacitor devices both at lab-scale and large-scale. Here, we report a comparison of a standard activated carbon that has a specific capacitance of 102.7 F/g with two of our tailored nanocarbon systems that show an improved specific capacitance of 127.1 F/g and 140.0 F/g. We believe that these results are a mere start towards achieving better performances and developing cost-effective supercapacitor systems for a plethora of energy applications.

References:

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